METHOD AND APPARATUS FOR USING A TWO-WAVE MIXING ULTRASONIC DETECTION IN RAPID SCANNING APPLICATIONS

ABSTRACT

The invention is directed to a wave characteristic adjusting device used to compensate for a wave characteristic distortion caused by the scanning motion of a probe beam of a two-wave mixing interferometer. The invention is also directed to an apparatus and method for using the wave characteristic adjusting device in a rapid scanning laser ultrasound testing device. In a rapid scanning laser ultrasound testing device, a laser pulse is directed at periodic points along a path across the surface of a manufactured object. The laser pulse initiates an ultrasonic signal associated with the manufactured object. An interferometer may be used to measure the initiated ultrasonic signal. The interferometer scans a probe beam along a path similar to the sonic initiating laser. A pulse of the probe beam is directed at the manufactured object in the vicinity of the initiating laser pulse while continuously scanning. As a result, the probe beam pulse may exhibit a Doppler shift. This Doppler shift may cause a loss in sensitivity of the two-wave mixing interferometer. The wave characteristic adjusting device may be used to compensate for the Doppler shift, thereby improving the sensitivity of the two-wave mixing interferometer.